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ABSTRACT

The Washington state Title I Migrant Program Evaluation project is a feasibility study designed to assess the suitability of existing normed criterion referenced tests to measuring mathematics achievement at grades four, five, and six. Objectives include judging the technical qualities and content of several normed criterion referenced tests; evaluating selected tests by administering them to a sample of migrant students; and developing specifications for an acceptable test if those available are inappropriate. The conceptual framework requires a means of establishing content domain; location of normed criterion referenced tests; guidelines for test evaluation; and appropriate sources of information to use in applying the guidelines. A subset of the Math Skills List (MSL) from the Migrant Student Record Transfer System (MSRTS) has been adopted, and some published norm referenced tests have been considered as evaluation instruments. Guidelines for test evaluation have been adopted from an existing model and cover ten categories: objectives, test items, administration, layout, reliability, cutting scores, validity, norms, test score reporting, and interpretation. Sources of information to aid in applying the guidelines include test manuals and technical papers, test item judges, field tests, and local conditions. (Activities to carry out the study are described.) (MH)

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Making Room for Foster Children:
A Criterion-Referenced Approach to
ESEA Title I Migrant Program Evaluation

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Running Head: Migrant Program Evaluation

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Migrant Program Evaluation

Abstract

This paper explains a new, criterion-referenced approach for assessing the impact of the ESEA Title I migrant education program at State and local levels. The State of Washington is investigating the use of existing normed criterion-referenced tests (CRTs) as impact measures for Title I migrant projects in mathematics at grades four, five, and six. The nationally developed Math Skills List for migrant students and the Migrant Student Record Transfer System are components of this plan. Potential problems and uses of the approach are discussed.

Making Room for Foster Children:
A Criterion-Referenced Approach to
ESEA Title I Migrant Program Evaluation

As you know, this symposium is called "Remodeling Title I Evaluation." We are here to talk about variations and alternative models for Title I evaluation. One group of Title I students especially deserves some attention in this regard: Title I migrant students, i.e., children of migratory agricultural workers and fishermen. They are the "foster children" or, at best, the "stepchildren" of Title I evaluation. They live in the most jerrybuilt, ill-repaired evaluation house on the block. The vast majority of Title I students are not migratory, and the Title I evaluation models built for nonmigrant students simply do not have enough entrances and exits for migrant students. At present the evaluation structures inhabited by Title I migrant children have holes knocked in the walls from so much movement and probably defy the Safe Housing Code.

Legislative Background and the National Situation

Why do the Title I evaluation models fail to fit migrant students? Let us look for a moment at those models. The legislative mandate for the models comes from P.L. 89-10, Section 151 (the Elementary or Secondary Education Act of 1965), as amended by P.L.

93-380 (the Education Amendments of 1974). As stated in the legislation:

(d) The Commissioner shall provide to State educational agencies, models for evaluations of all programs conducted under this title . . . , which shall include uniform procedures and criteria to be utilized by local educational agencies, as well as by the State agency in the evaluation of such programs. . . .

(f) The models developed by the Commissioner shall specify objective criteria which shall be utilized in the evaluation of all programs and shall outline techniques . . . and methodology . . . for producing data which are comparable on a statewide and nationwide basis. (Emphasis added.)

It should be emphasized that the term "programs" refers to federally funded programs under Title I, not local projects. The legislation does not specifically mandate evaluation models which provide locally useful data. It also does not mandate aggregation of data upward from district to State to federal levels. The legislation simply demands methods for producing data which are comparable on a statewide and nationwide basis, although "data comparability" has frequently been interpreted as synonymous with "data aggregatability."

The Title I evaluation models developed by Research Management Corporation (RMC) under contract to the U.S. Office of Education

(USOE), are intended to produce data which are both comparable and aggregatable. The RMC models were not developed to encompass the Title I migrant program, and the mobility of migrant students makes use of the RMC models problematic with such students. Migrant children often spend little time in a particular project and are generally not in a single project for the entire period between pre- and posttests. According to most studies (see Cox, Pyecha, & Cameron, 1976), migrant children typically attend at least two schools during the year, and some attend as many as six or eight schools. Sometimes they are not enrolled at all, i.e., when they are traveling, working in the fields, or needed for child care. Officials in the Migrant Program Branch, USOE, indicated that the average number of schools attended per year by migrant children is close to three, although the frequency of moving appears to be decreasing for some migrant children (Oxford, 1977, p. A.7).

In 1976, USOE's Office of Planning, Budgeting and Evaluation let a contract to the Research Triangle Institute (RTI), one of the purposes being "to develop an evaluation handbook and uniform reporting models for use by State and local evaluators of migrant education programs, and by USOE staff in their analysis of State evaluation reports" (Cameron, Burkheimer, Clayton, Drummond, & Hunt, 1978, p. 21). RTI's initial efforts focused on development of models for projects at the

school building and district levels (Pyecha, Clayton, & Thomas, 1978, p. 2). It was assumed that under these new migrant models the results of building and district projects could be aggregated up to the State level and then across States to the national level (Pyecha et al., p. 2), as is done under the RMC models.

However, after much agonizing, RTI found that it was impossible to create a set of models "that would require aggregation of local project evaluation results to provide meaningful evaluation data at all three decision-making levels (local, State, and national)" (Pyecha et al., pp. 2-3). The reasons were detailed in several RTI reports (Cameron et al., 1978; Pyecha et al., 1978). First, most migrant students are so mobile that it is impossible to associate them with one and only one local project per year. Second, test instruments are generally insensitive to achievement growth over short time periods. Third, it is problematic to aggregate migrant achievement data because of variation in testing dates and time intervals between pretesting and posttesting for migrant students, both within and between projects. Fourth, the highly mobile migrant students--the ones for whom the program is most important--are usually omitted from local project evaluation due to lack of required data. Fifth, even if a set of models were available for local project evaluation, it is unlikely that comparisons could be made between different projects operating

for different lengths of time, at different times of the year, and with different local objectives.

Because of these constraints, RTI decided to design an impact evaluation system which is focused on the national level but also provides descriptive and impact-related data on a statewide basis (Pyecha et al., 1978). In this system the individual student, not the project, is the unit of analysis. All migrant students are to be tested annually with a standardized, norm-referenced instrument in reading and mathematics, with results transmitted via the computerized Migrant Student Record Transfer System (MSRTS). It was concluded in an RTI study (Oxford, 1977) that criterion-referenced tests were not feasible at the time for use in the national evaluation. The plan to develop models for State and local migrant evaluation was officially omitted from the design of the system with the approval of USOE (Cameron et al., 1978; Pyecha et al., 1978).

This still left State and local evaluators without usable models or approaches for conducting their own migrant education evaluation. As described above, RMC's and RTI's efforts at building Title I evaluation models were geared toward producing comparable and aggregatable data. This type of data may not be available for local Title I migrant projects at this stage in our evaluation technology development. A new approach is needed, one not necessarily based on a

comparable metric. The State of Washington recognized this need and decided to explore a criterion-referenced approach to Title I migrant education evaluation. We will turn now to the situation in Washington State.

The Washington State Situation

Concern regarding the impact of instruction provided migrant children in the State of Washington has been expressed at a variety of levels. Classroom teachers have for quite some time been arguing that traditional methods of evaluation are not satisfactory and further may very well be counterproductive. LEA program managers have expressed deep frustration at the lack of match between traditional measurement practices often required by regulatory and/or funding sources and the type of instruction actually being delivered in the classroom. SEA program supervisors of migrant programs within this State have labored diligently to produce some type of systematic flow of service from the State to the child. This includes health services, inservice training activities for teachers, recruitment of students, and even specialized tutoring programs. The stumbling block that appears to confound all efforts is the lack of a reasonable process for determining the effect of these various efforts on the migrant child. At present no plan has emerged that will allow examination of classroom data utilizing results for instructional planning and also allow for use of pertinent data for aggregation at other levels of management.

Three years ago the Testing and Evaluation Section of the Office of the Superintendent of Public Instruction was asked to provide evaluation support to the migrant program. During this time the section has actively attempted to become acquainted with the intricacies of the program's operational process. Meetings have been held with LEAs, Migrant Center support staff, and colleagues in other states attempting to formulate a picture of what is really "out there." Many problems were encountered and needed to be worked through before the staff was able to begin discussion of various methods of solving mutual evaluation problems. Foremost among these difficulties was the need to establish clearly and unambiguously an understanding of what evaluators would be doing "out there." This dialog, it is fair to say, is still going on. The low trust level existing between program people and evaluators is a barrier of no small dimension. The operational definition of program evaluation seems to differ from person to person (and very likely from evaluator to evaluator).

Despite the continuing problems, we have established some reasonably secure beachheads. The decision of the State to move ahead with the Title I Evaluation and Reporting System over the past two years had helped to open an active dialog with LEAs and allow a cooperative effort to emerge. Since many of the LEA program people

who deal with Title I, Part A are also those who are charged with the responsibility for Title I migrant education, we have found fertile ground for interaction.

Focus of the Project

The Testing and Evaluation Section began to consider a criterion-referenced approach to Title I migrant evaluation using one of the two sets of objectives developed by the Migrant State Coordinators. Two lists of specific objectives, the Math Skills List (MSL) and the Reading Skills List (RSL), were installed on the computerized Migrant Student Record Transfer System (MSRTS) so that the progress of individual students could be tracked in reading and mathematics, regardless of the students' mobility patterns. The Testing and Evaluation Section called for aid from the Title I Technical Assistance Centers for Regions VIII, IX, and X, housed at the Northwest Regional Educational Laboratory in Portland, Oregon. Thus began the collaboration which resulted in the current project. The project was funded by the Superintendent of Public Instruction of the State of Washington and also by USOE under the "State Refinements" provision of Title I, Section 151-C.

The project is designed to assess the suitability of existing normed CRTs as impact measures for Title I migrant projects in

mathematics at grades four, five, and six in the State of Washington.

The objectives of this study are:

1. To review judgmentally the technical qualities and content of three or four normed CRTs for use in evaluating Title I migrant projects.
2. If at least one of the available normed CRTs is considered appropriate based on the judgmental review, to evaluate empirically the selected test(s) through administration to a sample of migrant students.
3. If none of the available normed CRTs is appropriate, to develop specifications for a CRT that would be appropriate (optional).

Why the interest in a criterion-referenced approach to migrant education evaluation? Pyecha et al. (1978, p. 30) enumerated a number of reasons why norm-referenced tests (NRTs), which are often contrasted with CRTs, have been criticized: (a) underrepresentation of disadvantaged and minority students in the test development and standardization processes; (b) underrepresentation of low-difficulty test items, resulting in test insensitivity to growth of low-achieving students over time; (c) an inadequate test floor for disadvantaged and minority students; (d) mismatches between test content and project objectives; (e) test construction which is not based on a

representative sample of expected learning behaviors; and (f) misinterpretation of grade equivalent scores in reporting results. CRTs, it was thought, might avoid some of these problems, provide more flexibility in timing of test administration, and offer more explicit information than NRTs about what a student can or cannot do relative to specific objectives or skills (Oxford, 1977).

However, it is recognized that CRTs, which are constructed to give achievement or mastery data on specific objectives, can also provide normative information. The authors reasoned that a normed CRT might be more useful than either a "pure" NRT or a "pure" CRT in a State or local evaluation design for migrant education.

The planning phase of the project has now been completed, and implementation of the project is about to start. We will briefly explain the framework and activities of the project, which is described in more detail in the Technical Proposal (Testing and Evaluation Section, OSPI, 1978) and the Plan for Migrant Education Test Evaluation Project (Testing and Evaluation Section, OSPI, 1979). We will first discuss the conceptual framework which shapes the project's activities in order to meet the three objectives mentioned earlier.

Conceptual Framework

The conceptual framework of the project requires (a) some means for establishing the content domain, (b) the availability of CRTs that

are normed, (c) guidelines or standards for evaluating such tests, and (d) appropriate sources of information to be used in applying the guidelines.

Content Domain

A significant feature of the present project and one that should make its results useful in settings beyond the State of Washington is the decision to adopt the Math Skills List (MSL) from the Migrant Student Record Transfer System (MSRTS) as the set of objectives to be measured by the selected test. The project's content domain will be confined to the subset of the MSL which has been identified for application at grades 4-6.

The MSL for grades 4-6 consists of some 314 skills categorized in a hierarchical system with four levels of generality. The four levels ranging from the most general to the most specific consists of areas, topics, subtopics, and skills. The specific skills included in the grades 4-6 section of the MSL define the content domain of interest in the present project.

For grades 4-6 the areas are number meaning, whole numbers, fractions, measurement, probability and statistics, and sets. Within each of these areas there are from one to six topics, within each topic there are from four to 50 subtopics, and within each subtopic there are from six to 32 skills.

Availability of Normed CRTs

The appropriateness of pure CRTs for project evaluation is still hotly debated (c.f., Ebel, 1978; Popham, 1978). Recent hybridizations of CRT and NRT development techniques have offset some of the unresolved disputes between antagonists favoring one type of tests to the possible exclusion of the other. Some of the more popular published tests designated as CRTs have been normed. These include the Stanford Diagnostic Mathematics Test, the Diagnostic Mathematics Inventory and the Everyday Skills Test. Such tests, in theory, offer greater flexibility and information-producing potential than some CRTs or NRTs.

Guidelines for Evaluating Normed CRTs

Generally accepted standards for evaluating CRTs are not yet available. However, some attempts at developing more general guidelines have provided a useful basis for making more informed testing decisions. One such set of guidelines has been proposed by Hambleton and Eignor (1978).

The guidelines proposed by Hambleton and Eignor cover ten broad categories, including objectives, test items, administration, test layout, reliability, cut-off scores, validity, norms, reporting of test score information, and test score interpretation. These guidelines will serve as a basis for a technical review of normed CRTs.

Sources of Information for Applying the Guidelines

A search for the information that would be useful in addressing questions under each of the Hambleton and Eignor guidelines would lead one to the following sources: (a) test manuals and technical papers, which provide information concerning test objectives, procedures for item generation, test items themselves, administration procedures, test format, reliability, cut-off scores, validity, norms, reporting options, and guidelines for interpretation; (b) test item judges, who assess content relevance, bias, functional relevance, and technical adequacy during a systematic review of items from specific tests; (c) field test in the local context, which offers information on such things as reliability, validity, local norms, ease of administration, and reactions of teachers and students to the test; and (d) local situation, which covers the intended applications of the test data, the local objectives of instruction, the characteristics of the local populations to be tested, the general acceptance of the objectives of instruction, and additional information concerning constraints affecting testing such as cost and time.

The main sources of information for Objective 1 (the judgmental review of content and technical qualities of selected tests) will include the local situation, test manuals, technical reports, and test item judges. Objective 2 (empirical evaluation of a test or tests)

will require a field test conducted in the local context. Objective 3, which is optional, is a developmental effort rather than an evaluative one. It requires information about objectives as locally defined.

Project Activities

Now that the project's conceptual framework has been discussed, we can present the specific activities in the project. Figure 1 is a flowchart of the project activities. Details about each of these activities are given below.

Insert Figure 1 about here

Establishment of Steering Committee

A Steering Committee is being established (a) to give advice to the Project Director, Marion E. Cupp, concerning academic problems faced by migrant students in mathematics and (b) to serve as a communication link to the field regarding the intent, progress and findings of the project. The Steering Committee will include a local administrator, a teacher with migrant education experience, a person familiar with the migrant community, and a staff member from the Migrant Center in the State of Washington who has expertise in mathematics instruction.

MSL Review

The next task in the project is a preliminary activity which must be conducted before Objective 1 (judgmental review of tests) can be

fulfilled. The activity is a review of the grades 4-6 section of the MSL. For the purposes of this study, it is important to determine at what grade level the various math skills drawn from the MSL are typically provided. Further, we want to estimate what percentage of entering students of grades 3-7 have mastered a particular skill. Teachers from appropriate grades who have experience in teaching mathematics to migrant students will conduct the review of the MSL.

Working singly they will determine from their own experience:

(a) whether the skills are taught at all, (b) whether the skills are appropriate for the grade level recommended in the MSL, (c) the percentage of students who would have mastered the skill when entering a particular grade, and (d) whether significant math skills are taught but are not included in the grades 4-6 section of the MSL. At the end of the individual MSL review, data will be tabulated with areas of concurrence and disagreement indicated. The results of these findings will be analyzed in tabular form and will be available for use in examining the test instruments.

Initial Screening of Tests to Be Considered

A set of normed CRTs must be defined which measures mathematics achievement, has recent norms covering grades 2-6, identifies objectives for which items are written, contains at least three items per objective, and has items from one or more of the areas covered by

the MSL. This is an initial screening activity which takes place following the MSL review and before the review of tests.

Technical Review of Tests (Objective 1-b)

After the set of relevant normed CRTs is defined, the technical review of these tests will be conducted by testing experts using the Hambleton and Eignor guidelines described earlier. A checklist or rating scale will be developed to cover the technical guidelines in all ten categories.

Content Review of Tests (Objective 1-b)

A content review will take place concurrently with the technical review. The purpose of the content review is to analyze the item content of the tests against the skills listed in the MSL. Although the MSL extends across grades K-9, the review will be limited at this time to those skills established for grades 4-6. Three-person teams consisting of a curriculum specialist and two teachers will analyze the content of each test item from the selected tests. Each team will include teachers who have taught mathematics to each of the three grade levels (4-6) within the last five years. Team members will be given a set of cards, one card per item from the tests chosen for the content review. On each card will be a content checklist and rating scale.

Based on the judgment of the content review teams, each test will be rated on content relevance, content bias, and technical quality.

An index of the functional relevance of the tests is also provided by combining information from the MSL review and the test content review. Judges will have indicated the grade levels at which instruction is provided for each of the skills of the MSL. They will also have estimated the proportion of migrant students at each of four different grade levels who would be expected to master each of the skills on the MSL grades 4-6. These data will be used to generate an "ideal distribution" of the proportion of functionally relevant skills from the MSL at each of the three grade levels under investigation.

A skill will be considered functionally relevant for a grade if:

1. At least 30 percent of the judges indicate they provide skill instruction at that grade, and
2. There is more than a 30 percent difference between the estimated percentage of migrant students demonstrating mastery at the beginning of the grade level of interest and the beginning of the next grade level.

These criteria may be adjusted if they result in skills lists that tend to be excluding or including too many skills per grade level.

Applying these criteria to the skills in order to generate ideal distributions will make it possible to compare each test scale in terms of the proportion of items related to each skill, subtopic, topic, or area. The more closely a test matches the idealized

proportions for a particular grade level, the more appropriate the content of that test.

Field Test of Selected Instrument(s) (Objective 2)

The findings from the MSL review and the technical and content review of tests will need to be augmented through a field test of one or more instruments in local settings. The previously described activities (MSL and test reviews) are projected to consume a minimum of six to eight months. Project personnel desire to postpone the field tests until the second year of the project, which will give adequate time to interpret the findings from the MSL and test reviews. Two types of analyses will result from the field test: (a) a psychometric analysis of the reliability and validity of items and of the total test and (b) an analysis of naturalistically observed factors such as ease of administration and behavior of students and teachers in the testing situation (Cronbach, 1971).

Development of Test and Item Specifications (Objective 3)

This is the default option to be used only if no normed CRT adequately measures the skills on the MSL. This option involves: (a) identifying specific purposes for the test (diagnosis of individual students' needs, program evaluation, etc.), (b) writing general test specifications based on these identified purposes, and (c) writing item specifications to indicate how each important MSL

skill should be measured (e.g., item type, number of items per skill, and mastery levels for a cluster of items).

Potential Problems

The scope of the project's activities has just been described. At least four problems might arise in implementing these activities.

First, the probable limitation of the number of available normed CRTs will undoubtedly create some problems for program people, who may approach their instructional task with different goals and objectives than those embodied in the available instruments.

Second, the possibility that the MSL objectives may not match the instructional plan used in LEAs is an area of concern. This may leave unexamined significant instructional areas or create subtle pressure for teachers to shape their instruction toward the MSL objectives.

Third, the utilization of findings within a single LEA will not alleviate the difficulty of sharing and exchanging data between various LEAs serving the migrant student. The complexity of this interaction is a technically solvable problem, but will require considerable effort.

Fourth, aggregation of data across local projects for use at a higher level is still problematic under this approach. Aggregation would require all projects to use a common metric to produce comparable data. Depending on (a) the test selected or developed,

(b) how the test is used, and (c) what scores are available, the criterion-referenced approach might or might not lead to aggregation.

Potential Uses

The present effort at grades four, five, and six is seen as a feasibility study. Positive findings would lead to a well-designed pilot study to examine the relationship existing between the CRTs and the MSL at other grade levels. The provision of reliable and valid means for program people to assess the outcome of instruction is seen as a significant contribution to program planning and instruction.

Should one or more normed CRTs be found to meet our criteria, this would cause the State of Washington to rethink its position regarding the use of CRTs in migrant program evaluation. Further, this would allow for the orderly flow of information regarding student progress via the MSRTS and might produce data for SEA program planning and evaluation.

If usable CRTs are identified, LEAs should find these results helpful, because there is definite need for instrumentation that will aid in measuring short-term gain.

If the results do not support the use of one of the examined CRTs in measuring achievement of the objectives of the MSL, the process of classifying the areas of difficulty and listing suggested methods to correct the encountered difficulties would be helpful to the

evaluation field at large. This process would also aid the State of Washington in developing useful evaluations for local projects and in obtaining data for State-level decision making and reporting.

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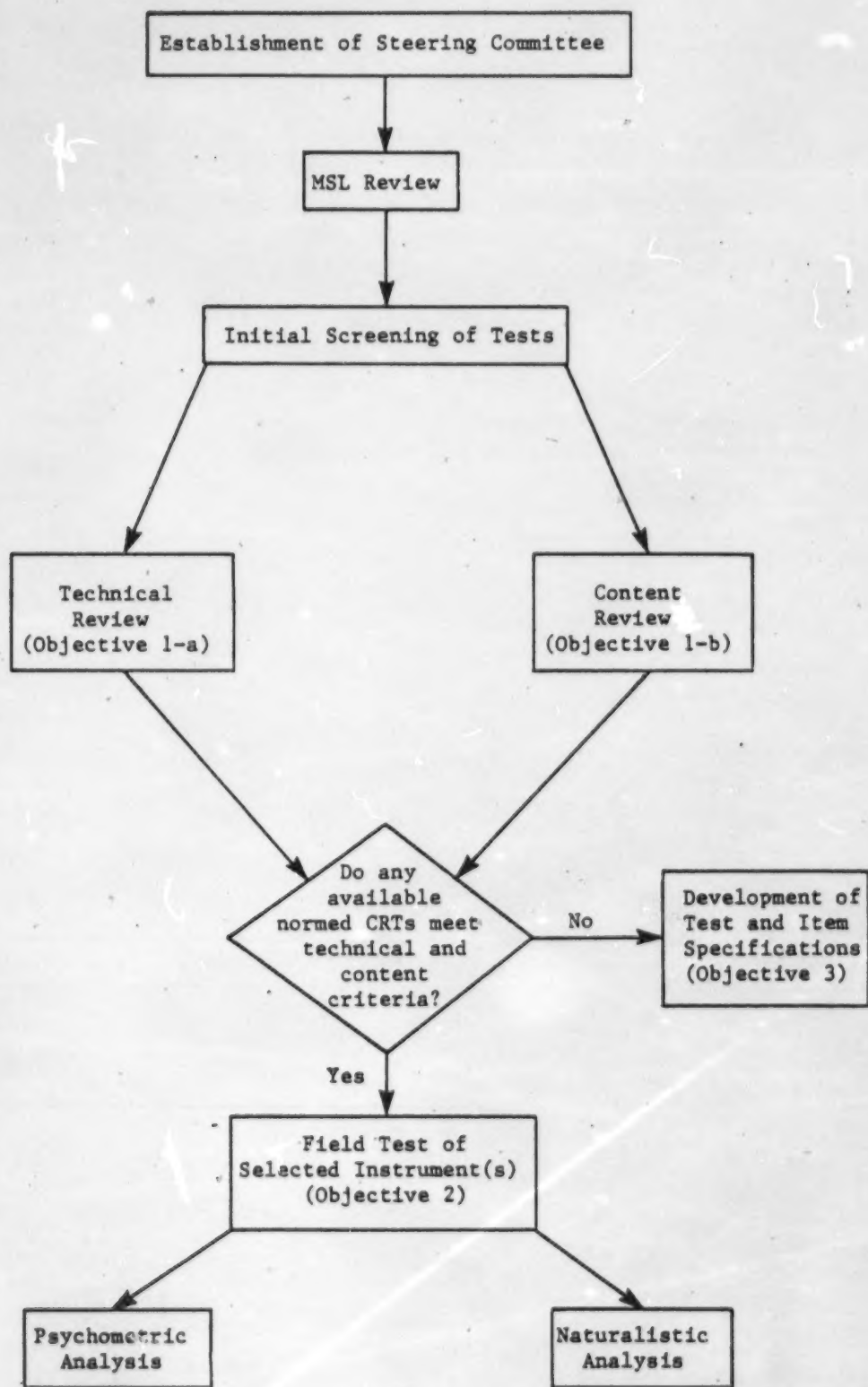


Figure 1. Flowchart of Project Activities